the cad academy®

Design for Engineering Academy Overview

Design for Engineering Academy (DFEA) enables instructors to effectively teach engineering design + manufacturing applications using SolidWorks. DFEA prepares students for engineering school + career opportunities in mechanical design and manufacturing. Teaching solid modeling, manufacturing concepts and automated production has never been this easy. DFEA offers a customizable two year engineering program for both the K-12 and Post-Secondary markets.

9th Grade TE-1905 Fundamentals of Engineering Technology

Fundamentals of Technology is a prerequisite course for most of the Technology Education systems. Communication skills and tools are the major focus of this course. These same skills are central to all subsequent technology courses. The computer and other electronic devices are necessary for teaching an understanding of contemporary communications, manufacturing, power/energy/transportation and construction systems. An engineering focus of problem solving requires students to define a given problem, conduct appropriate research, develop solutions to the problem, construct prototypes, and evaluate their work. This course is designed to introduce students to those principles and skills used in subsequent technology courses. Students learn to sketch solutions to problems, create technical drawings and presentations, build models, and apply creative problem solving methods. Emphasis is placed on accessing and communicating information, using simple and complex tools in a safe manner, and increasing the students' awareness of the historical and contemporary implications of technology. Students are introduced to computer-aided graphics, design software, and computer-aided manufacturing. Students develop an understanding of the tools, techniques, and processes of technology using design principles, computers, problem solving and model making.

Get Prepared and Get Certified!

The Design for Engineering Academy builds foundational design skills for students by starting with the most basic sketching applications and ends with advanced assemblies and automated manufacturing machining projects. This rigorous two year program fits at a high school level and at the community and technical college level. The DFEA training program includes instructional videos on each facet of design and manufacturing and culminates with challenging projects that students keep in a portfolio to present to employers or admissions to engineering schools.

10th Grade - First Semester
1. Sketching in SolidWorks
2. Basic Features of SolidWorks
3. Intermediate Modeling Concepts
4. Design for Manufacturing
5. Part Analysis and Material Properties

10th Grade - Second Semester
1. Reverse Engineering
2. Introduction to CNC
3. School Specific Machine Characteristics
4. Basic CAMWorks Operation
5. Assemblies in SolidWorks

11th Grade - First Semester
1. Communication with Drawings
2. Advanced Views and Annotations
3. Design Libraries
4. CNC Review
5. Basic CNC Machining with CAMWorks

11th Grade - Second Semester
1. Tool Paths
2. CNC Lathe
3. Review for SolidWorks CSWA Examination
4. Review for ADDA Mechanical Industry Certification Exam
5. Examination Administration

12th Grade – Yearlong Capstone – Engineering Technology Design & Development

An engineering research course in which students work in teams to research, design and construct a solution to an open-ended engineering problem. Students apply principles developed in the four preceding courses and are guided by a community mentor. They must present progress reports, submit a final written report and defend their solutions to a panel of outside reviewers at the end of the school year. The EDD course allows students to apply all the skills and knowledge learned in previous Design for Engineering courses. The use of 3D design software helps students design solutions to the problem their team has chosen. This course also engages students in time management and teamwork skills, a valuable set for students in the future. This course is designed for 12th grade students.

Design for Engineering Academy

- Two year flexible use engineering program
- SolidWorks CSWA + CSWP Training Program (100+ exercises)
- CAMWorks - SolidWorks integrated CAM software
- CAM Training Program
- Design for Manufacturing Pro Software (Validation of Design Manufacturability)
- Engineering Projects Putting Designs into Project Applications (Ex. F1 + CO2)
- Design for Manufacturing Concepts Curriculum
- Manufacturing + Automation Resources
- Milling + Turning Projects for Mill, Lathe and Router
- CAD + CAM + CNC + Machine Control Training
- Extreme Engineering Collection from the Discovery Channel

Instructor Resources include: Lesson Plans, Reading Assignments, PPTs, Videos, Lab Exercises, Handouts + Exams

SolidWorks Training + Certification

DFEA provides a complete library suite of the very best in SolidWorks self-paced instruction. The suite includes Core Concepts, Drawings, 3D Skills, Advanced Parts, Advanced Assemblies, Sheet Metal Design and Update Training.

The SolidWorks Certification Study Course is a comprehensive review of topics covered in the updated 2008/9 version of the Certified SolidWorks Associate and Certified SolidWorks Professional exams. The course begins by providing an overview of the certification exam. The student is then presented with sample problems which map to certification exam requirements including basic +advanced part and assembly design. Additional topics include but are not limited to: in-context design; drawing views and COSMOSXpress stress simulation.

ADDA Industry Certification

DFEA has partnered with the American Design Drafting Association (ADDA) to provide academic institutions a certification program with a proven methodology for effective measurement of academic program, instructor and student industry competencies. Certification programs are available for the areas of architecture, mechanical, civil as well as general drafting and design, not on their knowledge of a particular software program. ADDA Certification empowers students by authenticating their capabilities to colleges, universities and prospective employers.

The ADDA is recognized as the premier design drafting certification program by many organization including: U.S. Department of Labor; U.S. Department of Education; and ASME - American Society of Mechanical Engineers. It is supported by major U.S. Industries and governmental groups including: Boeing Corporation; NASA and U.S. Corp of Engineers.

DFEA program includes the ADDA Certification Test Guides for academic mapping and instructor preparation. Instructor or Academic Program Certification would enable the school or instructor to proctor student certification exams.

Automated Manufacturing (Computer Aided Manufacturing)

Machining made easy! CAMWorks is an easy to use intuitive solids based CAM solution that helps manufacturers increase productivity and profitability through best-in-class technologies and adaptable automation tools that maximize machining efficiencies. CAMWorks seamless integration within SolidWorks allows for instant changes from the part to the model and thereby eliminates time consuming CAM system rework due to design updates. CAMWorks thus enabling true associative machining. CAMWorks helps manufacturers across aerospace, automotive, electronics and medical industries optimize and evolve their automation process.

Minimize Efforts! CAMWorks eliminates the drudgery of CNC programming with Intelligent Machining through automation. CAMWorks automates the generation of tool paths based on a knowledge based database. CAMWorks eliminates hours of complex programming through Automatic Feature Recognition (AFR) that automatically defines prismatic machinable features, while the TechDBTM (Technology Database) defines machining operations to automatically generate accurate toolpaths at the click of a button for turning, 2.5 axis, 3 axis, 4 axis and 5 axis machining. Intergrated projects provide

experience in milling, turning, router and plasma cutting technologies. CAMWorks imports popular file formats including: STEP, IGS and Parasolid files for tool path generation and simulation

Machining

CNC Program (K-12 + Post Secondary + Technical School): The goal of this curriculum is to teach how to program and operate a Computer Numerical Control (CNC) milling machine.

Intended for persons with a technical background but little or no machining experience, it bridges the gap between what those with a technical education know and what they need to learn to make prototype and short-production run parts on a Vertical Milling Center (VMC).

Top 10 Benefits:

1. Designed for engineers
2. Close the gap between idea and practice
3. 2D Mill, 3D Mill, Lathe
4. A Haas Technical Education Center (HTEC) Partner
5. CNC Safety, setups, planning, processes, cutting speeds and feed, tool selection
6. Haas operating instructions and videos
7. Used by leading universities and secondary schools
8. Help students compete in design and build competitions such as S.A.E. Formula race, Technology Student Association, and Department of Energy Solar Challenge
9. Practical, hands-on, real-world
10. A concise guide to understanding, programming, and operating CNC mills and lathes
11. A Haas Automation, Inc. HTEC Partner product